To: John Bell[jbell@hsia.org]; CLARK, SHANNA L GS-13 USAF DoD AFCEE/TDV[Shanna.clark@us.af.mil]; Bernard Gadagbui[gadagbui@tera.org]; john.lowe@ch2m.com[john.lowe@ch2m.com]; Marybeth.markowitz@aphc.mil[Marybeth.markowitz@aphc.mil]; Mumtaz, Moiz (ATSDR/DTHHS/ETB)[mgm4@cdc.gov]; Ed Pfau[epfau@hullinc.com]; David Reynolds[dreynolds@iwpnews.com]; rodbthompson@comcast.net[rodbthompson@comcast.net]; gdt1@cdc.gov[gdt1@cdc.gov]; Lorenz Rhomberg[lrhomberg@gradientcorp.com]; tom.d.blackman@lmco.com[tom.d.blackman@lmco.com]; Lynne Haber[haber@tera.org]; Joseph.Haney@tceq.texas.gov[Joseph.Haney@tceq.texas.gov]; troy.j.meyer@honeywell.com[troy.j.meyer@honeywell.com]; LiuSh@cdmsmith.com[LiuSh@cdmsmith.com]; Morningstar, Mary P[mary.p.morningstar@lmco.com]; Anita.K.Meyer@usace.army.mil[Anita.K.Meyer@usace.army.mil]; Stralka, Daniel[Stralka.Daniel@epa.gov]; Jarman, Ruth[Rjarman@pb.com.au]; Chiu, Weihsueh[Chiu.Weihsueh@epa.gov]; Clark, Becki[Clark.Becki@epa.gov]; LiuSh@cdmsmith.com[LiuSh@cdmsmith.com]; ANDERSON, JANET K GS-13 USAF DoD AFCEE/TDV[janet.anderson.5@us.af.mil]; Kimberly_Wise@americanchemistry.com[Kimberly_Wise@americanchemistry.com]; Rick_Becker@americanchemistry.com[Rick_Becker@americanchemistry.com]; Pottenger, Lynn[lpottenger@dow.com]; John DeSesso[Jdesesso@exponent.com]; roger.brewer@doh.hawaii.gov[roger.brewer@doh.hawaii.gov]; janusz.byczkowski@epa.state.oh.us[janusz.byczkowski@epa.state.oh.us]; Ooi, Sim[SOoi@pb.com.au]; kroner@tera.org[kroner@tera.org]; audrey.rush@epa.state.oh.us[audrey.rush@epa.state.oh.us]; Virginia J CIV NAVFAC SW Makale[virginia.makale@navy.mil]; CNorman@PattonBoggs.com[CNorman@PattonBoggs.com]; Khoury, Ghassan[Khoury.Ghassan@epa.gov]; Podowski, Andrew[Podowski.Andrew@epa.gov]; Adams, Glenn[Adams.Glenn@epa.gov]; Olsen, Marian[Olsen.Marian@epa.gov]; McDonough, Margaret[Mcdonough.Margaret@epa.gov]; Bailey, Marcia[bailey.marcia@epa.gov]; Johnson, Jeremy[Johnson.Jeremy@epa.gov]; Hubbard, Jennifer[Hubbard.Jennifer@epa.gov]; Sivak, Michael[Sivak.Michael@epa.gov]; Vu, Chau[Vu.Chau@epa.gov]; Griffin, Susan[Griffin.Susan@epa.gov]; Benson, Bob[Benson.Bob@epa.gov]; Bussard, David[Bussard.David@epa.gov]; Flowers, Lynn[Flowers.Lynn@epa.gov]
From: Michael Dourson
Sent: Wed 3/20/2013 4:07:08 PM
Subject: 7th Conference Call regarding Alliance for Risk Assessment Project on TCE
MAIL_RECEIVED: Wed 3/20/2013 4:16:41 PM
Draft ARA TCE Management Summary_3-20-13.doc

Dear Colleagues

Our next conference call will be Monday March 25th from 2 to 4 pm. The call in number is 424 203-8400, code: 833440#. In preparation of this call, please find attached a draft executive summary of the consensus position developed by a team of scientists from government, NGO and private organizations.

As a reminder, the goals of the coalition include:

1. Develop additional risk assessment guidance on how to interpret the non-cancer endpoint when it is used for deciding clean-up standards or acceptable exposure levels when closing sites.
2. Clarify the issues surrounding the potential developmental cardiac malformations for use in understanding clean-up standards and short term exposure levels.
3. Explore the margin of safety measures used to set the TCE RfC and evaluate if these measures are consistent with the baseline principles developed for determining the RfC.

Our team invites comments and questions from all participants and observers on this draft consensus position.

Sincerely

Michael Dourson
Chair, Steering Committee
Alliance for Risk Assessment (*ARA*)
On 2/19/13 4:46 PM, "Michael Dourson" <mdourson@tera.org> wrote:

Dear Colleagues

Thanks for taking time out of your busy schedule last week to discuss this project. A draft set of notes follows; please feel to add to these notes.

Sincerely,

Michael Dourson
Chair, Steering Committee
Alliance for Risk Assessment (*ARA*)

Notes of the 6th Conference call on the TCE ARA Project: 2-14-13

Present:

- John Bell, Halogenated Solvents Industry Alliance (observer)
- Shanna Clark, USAF (observer)
- Michael Dourson, Alliance for Risk Assessment (participant)
- Bernard Gadagbui, Toxicology Excellence for Risk Assessment (participant)
- John Lowe, CH2M Hill (participant)
- Marybeth Markowitz, Amy Public Health Command (observer)
- Moiz Mumtaz, Agency for Toxic Substances and Disease Registry (ATSDR) (observer)
- Edward Pfau, Hull and Associates (participant)
- Dave Reynolds, Inside Washington News (observer)
- Rod Thompson, Alliance for Site Closures (participant)

The meeting started with a discussion of ground rules for participation by Mike Dourson. Discussion topics are completely open and reportable. However, with the exception of expected reports, attribution of a statement or question during discussion to either a person or his/her organization is not permitted. Observers are allowed to ask questions, but otherwise not participate in the discussion. All folks then introduced themselves and gave reasons for participation or observation. Afterwards, a review of additional work since the

time of the last conference call followed.

Bernard Gadagbui of Toxicology Excellence for Risk Assessment (TERA) described differences in cardiac development among species. The length of cardiac development time differs between rats at 7 days and humans at 24 to 30 days. The latter range was suggested as potentially being helpful in determining an averaging time for exposure estimates with which to compared health risk values, similar perhaps to Region X of EPA's choice of 21 days. After a brief discussion, Bernard was asked to contact Region X of EPA to explain their choice of 21 days for averaging time, and to work with members of the medical community to develop a choice of specific value for averaging based on the 24 to 30 day window of cardiac development in developing human fetuses.

Ed Pfau of Hull and Associates, John Lowe of CH2M Hill and Rod Thompson of the Alliance for Site Closures then reported on their work on uncertainties associated with the derivation of the RfC for TCE; with the hazard indexes based on the RfC for TCE; with the determination of the exposure concentrations, and with the determination of the exposure concentration with specific regard to the RfC for TCE. A discussion ensued regarding the imprecision of risk values in relationship to Hazard Quotient of 1 and the imprecision of multiple exposure measurements and different averaging times. Based on these multiple uncertainties and imprecisions, it would be very reasonable for a risk manager to make a safety decision at a concentration higher than the screening values determined by any one of EPA's individual RfCs. It was also considered very important by more than one participant for the biologists in the collective group to determine the length of time for cardiac development in humans, as possible exposure averaging time.

Bernard Gadagbui of TERA then reported on the judgments of various organizations on whether fetal heart malformations was used in their risk assessment. It appears that several organizations have mixed judgments on this endpoint, with some supporting its use and others not. This lead to discussion on the level of confidence with which a risk manager might place on any decision based on this endpoint; the general feeling of the group was that such confidence would be lower than with the other two endpoints.

Mike Dourson of the *ARA* then reported on the preliminary results of two methods for the development of hazard ranges around EPA's TCE RfCs. This first method used EPA's TCE BMD/L and suggested that a hazard range for nephropathy was more severe than for fetal cardiac effects. The second method used research by EPA's National Center for Environmental Assessment. It suggested that EPA's RfCs for nephropathy and immunotoxicity were the same at a 95% confidence level, whereas RfCs for fetal cardiac effects and immunotoxicity were not as similar at any confidence level. Moreover, depending on a risk manager's choice of confidence level, different RfCs would result, either higher or lower than what might be stated on EPA's IRIS or elsewhere.

A brief discussion of building the coalition then followed. ATSDR has joined the effort, and along with the other coalition members (Alliance for Site Closures, Alliance for Risk Assessment, CH2M Hill, Gradient, Honeywell, Hull and Associates, and Toxicology

Excellence for Risk Assessment) will work to develop draft guidance for discussion at the next open conference call. As mentioned in previous emails, other groups are welcome to join the coalition by either endorsement, sweat equity, or cash donation (or a combination of these) at any time. Groups can also decide to drop out at any time.

The next conference call will be held in about 4 weeks time.

-----Related Notes-----
Options to accomplish the work:

1. Staff of one of the *ARA* nonprofit partners would look at relevant scientific data, summarize critical studies and choices of dose response assessment models, and prepare tables for easy reference by a science panel. The panel would then get together for a one or two day meeting to discuss these summarized data and models and to determine the appropriate RfDs. The panel would be selected by the Advisory Committee, or perhaps the Steering Committee of the *ARA*. A subsequent peer review of the panel's work might be useful for this option. This option would cost the most.
2. Staff of one of the *ARA* nonprofit partners would look at relevant scientific data, summarize critical studies and choices of dose response assessment models, and determine the appropriate RfDs directly. A subsequent peer review of the partner's work would likely be useful for this option. This would cost less than the option 1.
3. **[This is the current option being used.] The Advisory Committee would designate one individual from each group who would work with other designated members to look at relevant scientific and management data, review critical studies and choices of dose response assessment models, and determine the appropriate risk management guidelines directly. A subsequent peer review of the group's work might be useful for this option. This would cost less than options 1 and 2.**

Relationship among groups:

- The Steering Committee of the Alliance for Risk Assessment (*ARA*) (http://www.allianceforrisk.org/ARA_Steering_Committee.htm) is like a board of directors for a nonprofit organization. The Steering Committee set the direction of the *ARA* and agrees to all incoming projects, but the committee does not do any work, although some of its member might. If the *ARA* was a separate nonprofit organization (it is not yet this), the Steering Committee would be considered its owners. This is true of any nonprofit organization in the US. For example, TERA is a nonprofit and its board of directors (http://www.tera.org/about/boardofdirectors.html) is considered to be the owner, even though none of the board members get paid and they do not own anything (if a nonprofit goes bankrupt, the board will distribute its assets to other nonprofit

organizations).

- The Advisory Committee is simply the committee that leads any particular project. In contrast to the Steering Committee, all members of the Advisory Committee are active and supporting participants in the specific project. For example, the *ARA* project "Beyond Science and Decisions: From Problem Formulation to Dose Response" has 55 sponsors, 4 of which form the Advisory Committee (ACC, EPA, TCEQ, and TERA). The Advisory Committee has not yet formed for this project but this is getting closer; several members on the conference calls will likely be members of this committee.
- A Science Panel for a project may or may not be needed depending on the judgment of its Advisory Committee. Advise of the *ARA* Steering Committee is often helpful in this judgment and sometime it takes an active role in the panel's selection. For example, the Science Panel of the "Beyond Science and Decisions: From Problem Formulation to Dose Response" was chosen by the *ARA* Steering Committee, because the project's Advisory Committee wanted a neutral group making the selections.
- A peer review committee might also be needed for any particular project. This can be seen as a variation in the Science Panel, particularly when the project has a more limited time span.

In option one, the Science Panel does most of the technical work. The project's Advisory Committee would likely either choose this panel, or it could ask the *ARA* Steering Committee to do this. If the latter, the Advisory Committee would be able to nominate folks to serve on this panel, including perhaps one or more members from its group. The project Advisory Committee would then take the role of support, such as procuring resources for the project and it could certainly participate in the public parts of the project. In option 2, one or more of the nonprofit partners do the technical work. Afterwards, the project's Advisory Committee could serve as a peer review, or it could select an independent group. **In option 3, the project's Advisory Committee would do the technical work. Afterward, it could have an independent panel review its work, or perhaps submit it to a journal for publication.**